

Table 2-H-20
Los Angeles to San Diego via Orange County – High-Speed Train Alignment Evaluation Matrix
Segment A – LA Union Station to LAX¹

Alignment = Alignment Carried Forward

Alignment = Alignment Eliminated

Alignment = Primary or Secondary Reason for Elimination

Evaluation Criteria	Interstate 405 and Interstate 10	MTA Harbor Subdivision	Interstate 105 and Interstate 110
Travel Time (Exp. = Express)	(Exp.) LA Union Station to: LAX – 18.2 min	(Exp.) LA Union Station to: LAX – 14.4 min	(Exp.) LA Union Station to: LAX – 17.0 min
	3	4	3
Length	23.2 miles (37.3 km)	15.8 miles (25.4 km)	20.6 miles (33.2 km)
	2	4	3
Population & Employment Catchment	See LAX and LA Union Station	See LAX and LA Union Station	See LAX and LA Union Station
	4	4	4
Intermodal Connections	See LAX and LA Union Station	See LAX and LA Union Station	See LAX and LA Union Station
	4	4	4
Length	23.2 miles (37.3 km)	15.8 miles (25.4 km)	20.6 miles (33.2 km)
	3	4	3

¹ Alignment Option A4 is not listed in this alignment evaluation matrix

Evaluation Criteria	Interstate 405 and Interstate 10	MTA Harbor Subdivision	Interstate 105 and Interstate 110
Operational Issues	<p>There are several curves along this alignment that restrict speed to 50 mph (80 km/h) and lengthen the overall trip times. This alignment has the longest distance and longest simulated trip times of this segment.</p> <p>Dedicated alignment along I-10 and I-405.</p>	<p>Dedicated alignment on MTA Harbor Subdivision, an existing rail line.</p> <p>This alignment has the shortest distance and shortest trip times of this segment. There are no curves tight enough to restrict speeds to 50 mph (80 km/h). However, there are curves that restrict speed to 75 mph (120 km/h).</p>	<p>This alignment is similar to Option A1, but is a shorter length and therefore shorter travel time.</p> <p>Dedicated alignment on I-110 and I-105.</p>
	2	3	2
Construction Issues	<p>General freeway alignment issues include room for columns, high aerial structures to pass over arterial highways and freeways, and staging of construction.</p> <p>Third/fourth level aerial construction along I-10 and I-405, due to elevated freeway segments and complex freeway/arterial interchanges.</p> <p>Potential physical conflict within LAX Expressway (elevated bypass), being studied for the median of I-405, from SR-90 to Century Boulevard</p> <p>Potential conflict with proposed maglev system along nearly 100% of the same alignment from LA Union Station to LAX.</p>	<p>Dedicated alignment may not be possible on west side of LA River, given existing/proposed Amtrak and Metrolink route to LA Union Station</p> <p>System is aerial to cross Alameda Corridor (freight) and MTA Blue Line in east, I-405 in west.</p> <p>Due to numerous crossing streets, trench assumed alongside Slauson and Florence Avenues, with two crossings closed.</p>	<p>General issues related to construction in a freeway alignment.</p> <p>Third/fourth level aerial construction along I-10, I-110 and I-105, due to elevated freeway segments and existing arterial overcrossings</p> <p>I-110 has an aerial viaduct with HOV lanes in the median, I-105 has MTA Green Line in the median.</p>
	1	2	1
Capital Cost	Very High Cost	High Cost	Very High Cost
	1	2	1

Evaluation Criteria	Interstate 405 and Interstate 10	MTA Harbor Subdivision	Interstate 105 and Interstate 110
Right-of-Way Issues/Cost	Very limited right-of-way available adjacent to freeways, median is also constrained	MTA owns the right-of-way, and may convert it for light rail or shared-use commuter rail and freight. Also, right-of-way is single track and parts may be too narrow.	Very limited right-of-way available adjacent to freeways, median also constrained
	1	2	1
Land Use Compatibility and Conflicts	Low- to medium-density residential with mixture of commercial and industrial uses. Parks, schools, and jail located adjacent to corridor.	Land uses similar to Option A1.	Low- to medium-density residential and commercial. Parks, schools, colleges and Hawthorne municipal airport is located adjacent to corridor.
	3	3	3
Visual Quality Impacts	High aerial structure added to existing freeway alignments. Visual impacts to and from heavy urbanized areas of suburban and downtown Los Angeles. Few areas of open space and natural vegetation along corridor.	Impacts along half of this alignment are mitigated by a trench, otherwise visual impacts are the same as described in Option A1.	Visual impacts are the same type described in Option A1.
	3	4	3
Wetland Impacts	Wetland areas known to occur within this option are the LA River, Ballona Creek, and Centinela Creeks.	1 Wetland area is known to occur within this option; the LA River.	Wetland areas known to occur within this option are the LA River and Dominguez Creeks.
Sites/Area	0/0	0/0	0/0
	3	3	3
Water Resources	There are 3 water resource crossings. (150 linear ft)	There is 1 water resource crossing. (50 linear ft)	There are 2 water resource crossings. (100 linear ft)
	3	3	3

Evaluation Criteria	Interstate 405 and Interstate 10	MTA Harbor Subdivision	Interstate 105 and Interstate 110
Floodplain Impacts	No floodplain impacts. 3	Floodplain adjacent to rail line within the City of Los Angeles. 2	No floodplain impacts. 3
Threatened & Endangered Species Impacts	There is 1 endangered, 1 threatened, and 1 species of special concern located within this option. 2	There is 1 endangered and 2 species of special concern located within this option. 2	There is 1 endangered species located within this option. 2
Environmental Justice Impacts (Demographics)	Potential impacts to minority population of approximately 105,000 people within this alignment option. Also potential impacts to approximately 540 low-income households within this alignment option. 1	Potential impacts to minority population of approximately 43,000 people within this alignment option. Also potential impacts to approximately 609 low-income households within this alignment option. 2	Potential impacts to minority population of approximately 154,000 people within this alignment option. Also potential impacts to approximately 900 low-income households within this alignment option. 1
Community and Neighborhood Impacts	There are impacts to 7 communities and neighborhoods within this alignment option. 2	There are impacts to 7 communities and neighborhoods within this alignment option. 3	There are impacts to 6 communities and neighborhoods within this alignment option. 2
Farmland Impacts	No farmland impacts. 5	No farmland impacts. 5	No farmland impacts. 5
Cultural Resources Impacts	4 sites of cultural or historic significance occur adjacent to this alignment option. 3	Several known sites of cultural or historic significance occur adjacent to this alignment option. 2	Several known sites of cultural or historic significance occur adjacent to this alignment option. 2
Parks & Recreation/Wildlife Refuge Impacts	There are 8 Parks and Recreation/Wildlife Refuge resources. 2	There are 3 Parks and Recreation/Wildlife Refuge resources. 3	There are 3 Parks and Recreation/Wildlife Refuge resources. 3

Evaluation Criteria	Interstate 405 and Interstate 10	MTA Harbor Subdivision	Interstate 105 and Interstate 110
Soils/Slope Constraints	There are 3 distinct soil types. Possible impacts from liquefaction and landslide occur along I-10 and I-405 near I-10 intersection. Potential earthquake induced landslides near LA Union Station.	Soils types are the same as described in Option A1. Potential hazard of liquefaction in area east of I-110. Some localized areas of potential earthquake induced landslides are the same as described in alignment Option A1.	Soils types are the same as described in Option A1. Potential for liquefaction along I-110 corridor south of Vernon Street. No potential impacts from liquefaction occur along I-105 corridor.
	3	3	3
Seismic Constraints	Potential impacts from 3 major seismic areas and faults occur within this alignment option. No faults are crossed by this alignment.	Seismic areas and faults along this alignment option are the same as Option A1.	Seismic areas and faults along this alignment option are the same as Option A1.
	3	3	3
Hazardous Materials/Waste Constraints	Several known hazardous waste sites occur along I-405 and I-10. A large concentration of sites is in close proximity to LA Union Station and the LOSSAN corridor.	Numerous hazardous waste sites located adjacent to alignment. Greatest concentration of sites located in the vicinity of the Alameda Corridor.	Several hazardous waste sites occur along I-105 corridor. No known sites along I-110 corridor. Numerous sites located along I-10 corridor with greatest concentration in proximity to LA Union Station.
	2	2	2

1 2 3 4 5
Highly Unfavorable Highly Favorable

Table 2-H-20 continued
Los Angeles to San Diego via Orange County – High-Speed Train Alignment Evaluation Matrix
Segment B – LA Union Station to Orange County

Alignment = Alignment Carried Forward

Alignment = Alignment Eliminated

Alignment = Primary or Secondary Reason for Elimination

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high-end improvements	Interstate 5 Freeway	Pacific Electric Right-of-Way	UPRR Santa Ana Branch Line
<i>Maximize Ridership/Revenue Potential.</i>					
Travel Time (Exp. = Express)	(Local) LA Union Station to: Norwalk – 11.7 min Fullerton – 19.4 min Anaheim – 25.4	(Local) LA Union Station to: Norwalk – 11.1 min Anaheim – 21.7 min	(Local) LA Union Station to: Norwalk – 11.8 min Anaheim – 22.1 min	(Local) LA Union Station to: Paramount – 9.6 min Garden Grove – 19.2 min	(Local) LA Union Station to: Norwalk – 11.4 min Anaheim – 20.9 min
	(Exp.) LA Union Station to: Anaheim – 19.4 min	(Exp.) LA Union Station to: Anaheim – 18.3 min	(Exp.) LA Union Station to: Anaheim – 19.0 min	(Exp.) LA Union Station to: Garden Grove – 16.4 min	(Exp.) LA Union Station to: Anaheim – 17.1 min
	2	3	3	4	4
Length	30.0 miles (48.3 km)	30.0 miles (48.3 km)	28.3 miles (45.5 km)	28.69 miles (46.18 km)	28.67 miles (46.15 km)
	3	3	3	3	3
Population & Employment Catchment	See LA Union Station, Norwalk, and Anaheim	See LA Union Station, Norwalk, and Anaheim	See LA Union Station, Norwalk, and Anaheim	See LA Union Station, Paramount, and Garden Grove	See LA Union Station, Norwalk, and Anaheim
	4	3	3	4	3
<i>Maximize Connectivity and Accessibility.</i>					
Intermodal Connections	See LA Union Station, Norwalk, and Anaheim	See LA Union Station, Norwalk, and Anaheim	See LA Union Station, Norwalk, and Anaheim	See LA Union Station, Paramount, and Garden Grove	See LA Union Station, Norwalk, and Anaheim
	4	4	3	3	3
<i>Minimize Operating and Capital Costs.</i>					
Length	30.0 miles (48.3 km)	30.0 miles (48.3 km)	28.3 miles (45.5 km)	28.69 miles (46.18 km)	28.67 miles (46.15 km)
	3	3	3	3	3

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high-end improvements	Interstate 5 Freeway	Pacific Electric Right-of-Way	UPRR Santa Ana Branch Line
Operational Issues	<p>Shared-use alignment, with delays from other rail traffic.</p> <p>This alignment has longest distance of this segment. The curves are moderate and simulated trip times are in the mid-range. There are several curves restraining speed to 75 mph (120 km/h).</p>	<p>There are no differences in trip time simulations between the 3-track Option B1a and the 4-track Option B1b.</p> <p>The complete fourth main track allows some segregation of passenger and freight, which adds operational flexibility and trip time reliability, compared with Option B1a.</p>	<p>Follows a freeway and has the most restrictive speed constraints and the largest simulated trip times for this segment. There are three curves limiting speed to 50 mph (80 km/h), and many other curves limiting speed to 75 mph (120 km/h).</p> <p>Dedicated VHS alignment.</p>	<p>This distance of this alignment is in the middle range for this segment. It has only one curve that restricts speed to 50 mph (80 km/h), and the simulated trip times are the shortest of this segment.</p> <p>Dedicated VHS alignment</p>	<p>This distance of this alignment is in the middle range for this segment. It has few speed constraints and short simulated trip times. There are several curves limiting the speed to 75 mph (120 km/h).</p> <p>Dedicated VHS alignment.</p>
	2	3	2	4	4
Construction Issues	<p>Some track construction from LA to Commerce and in Fullerton. Some additional grade-separations proposed – No major issues</p>	<p>Fourth Main track added in corridor along entire length from LA to Fullerton, numerous grade-separations of streets required in Anaheim - No major issues, but more complex than Option B1a.</p>	<p>General issues related to construction within a freeway alignment (See Option A1). Third level aerial construction along significant portion of I-5 due to existing arterial and railway over crossings</p> <p>Widening of I-5 has been studied in LA County (See right-of-way issues), and may complicate construction of VHS further.</p> <p>Follow UP right-of-way south of Beach Boulevard to Euclid, and thereafter, frontage road to Anaheim – avoids HOV structures in the median - this part of the alignment has fewer issues than LA County.</p>	<p>Grade-separated system in existing/former rail alignments, either aerial (industrial areas) or trench (residential areas) due to numerous existing grade crossings</p> <p>Possible to cross LA River (South Gate), Rio Hondo and Coyote Creek at existing profile (two road closures needed), but tunnel under San Gabriel River required to retain trench profile in nearby residential areas.</p> <p>Two channel crossings in OC would require reconstruction due to the trench profile.</p>	<p>Grade-separated system on existing rail alignment, either aerial (industrial areas) or trench (residential areas) due to numerous existing grade crossings in LA County and Buena Park.</p> <p>Possible to cross LA River (South Gate), Rio Hondo and San Gabriel River at existing profile, with transitions to/from trench on approaches</p> <p>Existing profile from Beach to Euclid is grade-separated due to recent construction along I-5, at-grade construction appears feasible.</p>
	5	3	1	1	2

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high-end improvements	Interstate 5 Freeway	Pacific Electric Right-of-Way	UPRR Santa Ana Branch Line
Capital Cost	Least Cost	Moderate Cost	High Cost	Highest Cost	High Cost
	5	4	2	1	2
Right-of-Way Issues/Cost	Some right-of-way for additional tracks. Fewest issues for Segment B.	Some widening of rail right-of-way required – most adjacent property is industrial. More widening than Option B1a.	Limited Right of Way in freeway corridor. Some property available for columns between existing freeway and frontage roads, in LA County. UP owns and operates the Santa Ana Branch, used by freight traffic.	San Pedro Branch is an existing freight line, owned by BNSF PE right-of-way is owned by MTA and by OCTA, lightly used by freight and intended for future transit facility.	San Pedro Branch is an existing freight line, owned by BNSF UP owns and operates the Santa Ana Branch, used by freight traffic.
	4	3	1	3	2
<i>Maximize Compatibility with Existing and Planned Development.</i>					
Land Use Compatibility and Conflicts	Low- to medium-density residential with mixture of commercial and industrial uses and open space. Some parks and schools located along the alignment option.	Low- to medium-density residential with mixture of commercial and industrial uses and open space. Some parks and schools located along the alignment option.	Low- to medium-density residential with mixture of commercial and industrial uses. Some parks, schools, cemeteries, and a hospital located along the alignment option.	Land uses for this alignment option are the same as described in Alignment Option B1a, B1b, and B2.	Land uses for this alignment option are the same as described in Alignment Option B1a, B1b, and B2.
	3	3	2	2	2
Visual Quality Impacts	Widening of an existing rail alignment in industrial and some residential areas. Less heavy visual impacts as corridor transitions into Orange County. However visual impacts remain residential, commercial, and transportation/utility development.	Visual impacts are similar to Option B1a, but more widening would occur in the same area.	Land Uses are similar to Option B1a, but impacts would be greater as this option adds a high aerial structure to the freeway alignment.	Overall mix of land uses similar to Option B1a, but would add a new transportation facility to the alignment, mitigated by a proposed trench.	Visual impacts would be similar to Option B2.
	3	3	2	3	2

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high-end improvements	Interstate 5 Freeway	Pacific Electric Right-of-Way	UPRR Santa Ana Branch Line
<i>Minimize Impacts to Natural Resources.</i>					
Wetland Impacts	Wetland areas known to occur within this segment are the Los Angeles, Rio Hondo, San Gabriel, and Santa Ana Rivers, the North Fork Coyote, Coyote, Fullerton, Carbon Creeks, and Crescent Basin.	Wetland areas known to occur within this segment are the Los Angeles, Rio Hondo, San Gabriel, and Santa Ana Rivers, the North Fork Coyote, Coyote, Fullerton, Carbon Creeks, and Crescent Basin.	Wetland areas known to occur within this segment are the Los Angeles, Rio Hondo, San Gabriel, and Santa Ana Rivers, the North Fork Coyote, Coyote, Fullerton, Carbon Creeks, and Crescent Basin.	Wetland areas known to occur within this segment are the Los Angeles, Rio Hondo, and San Gabriel Rivers, and Coyote and Moody Creeks.	Wetland areas known to occur within this segment are the Los Angeles, Rio Hondo, San Gabriel, and Santa Ana Rivers, the North Fork Coyote, Coyote, Fullerton, Carbon Creeks, and Crescent Basin.
Sites/Area	0/0	0/0	0/0	1/0.5 ac	0/0
	3	3	3	3	3
Water Resources	Impacts to 9 water resources. (450 linear ft)	Impacts to 3 water resources. (150 linear ft)	Impacts to 3 water resources. (150 linear ft)	Impacts to 8 water resources. (400 linear ft)	Impacts to 8 water resources. (400 linear ft)
	3	3	3	3	3
Floodplain Impacts	Crosses 4 floodplains	Crosses 4 floodplains	Crosses 1 floodplains	Crosses 1 floodplains	No floodplain impacts.
	3	3	4	4	5
Threatened & Endangered Species Impacts	There is 1 specie of special concern located within this option.	There is 1 specie of special concern located within this option.	There are 2 species of special concern located within this option.	There are 3 endangered, 1 threatened, and 4 species of special concern located within this option.	There are 2 species of special concern located within this option.
	4	4	4	3	4
<i>Minimize Impacts to Social and Economic Resources.</i>					
Environmental Justice Impacts (Demographics)	Potential impacts to a minority population of approximately 40,000 people and potential impacts to approximately 395 low-income households.	Potential impacts to a minority population of approximately 40,000 people and potential impacts to approximately 395 low-income households.	Potential impacts to a minority population of approximately 78,000 people and potential impacts to approximately 709 low-income households.	Potential impacts to a minority population of approximately 89,000 people and potential impacts to approximately 415 low-income households.	Potential impacts to a minority population of approximately 62,000 people and potential impacts to approximately 415 low-income households.
	3	3	2	2	2
Community & Neighborhood Impacts	There are impacts to 12 communities and neighborhoods that occur within this alignment option.	There are impacts to 12 communities and neighborhoods that occur within this alignment option.	There are impacts to 11 communities and neighborhoods that occur within this alignment option.	There are impacts to 21 communities and neighborhoods that occur within this alignment option.	There are impacts to 10 communities and neighborhoods that occur within this alignment option.
	3	3	3	2	3

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high-end improvements	Interstate 5 Freeway	Pacific Electric Right-of-Way	UPRR Santa Ana Branch Line
Farmland Impacts	There is 1 parcel of prime farmland located within Orange County.	There is 1 parcel of prime farmland located within Orange County.	There are 2 parcels of prime farmland located within Orange County.	No farmland impacts.	No farmland impacts.
	4	4	4	5	5
<i>Minimize Impacts to Cultural Resources.</i>					
Cultural Resources Impacts	There are several sites of cultural or historic significance that occur adjacent to this alignment option.	There are several sites of cultural or historic significance that occur adjacent to this alignment option.	There are two sites of cultural or historic significance that occur adjacent to this alignment option.	No known sites of cultural or historic significance.	No known sites of cultural or historic significance.
	3	3	4	5	5
Parks & Recreation/Wildlife Refuge Impacts	There are 4 Parks and Recreation/Wildlife Refuge resources.	There are 4 Parks and Recreation/Wildlife Refuge resources.	There are 10 Parks and Recreation/Wildlife Refuge resources.	There are 9 Parks and Recreation/Wildlife Refuge resources.	There are 6 Parks and Recreation/Wildlife Refuge resources.
	4	4	3	3	3
<i>Maximize Avoidance of Areas with Geologic and Soils Constraints.</i>					
Soils/Slope Constraints	2 distinct soil types occur along this alignment option. Some localized areas of earthquake induced landslides.	Soil and Slope Constraints are similar to Option B1a.	Soil and Slope Constraints are similar to Option B1a.	Soil and Slope Constraints are similar to Option B1a.	Soil and Slope Constraints are similar to Option B1a.
	3	3	3	3	3
Seismic Constraints	Potential impacts from 2 major seismic areas and faults. No faults are crossed.	Seismic Constraints are similar to Option B1a.	Seismic Constraints are similar to Option B1a.	Seismic Constraints are similar to Option B1a. The Newport/Inglewood Fault is close to this alignment along the PE right-of-way.	Seismic Constraints are similar to Option B1a.
	3	3	3	2	3

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high-end improvements	Interstate 5 Freeway	Pacific Electric Right-of-Way	UPRR Santa Ana Branch Line
<i>Maximize Avoidance of Areas with Potential Hazardous Materials.</i>					
Hazardous Materials/Waste Constraints	Several hazardous waste sites located adjacent to corridor. Greatest concentration of sites located in the cities of Fullerton and Santa Fe Springs.	Several hazardous waste sites located adjacent to corridor. Greatest concentration of sites located in the cities of Fullerton and Santa Fe Springs.	Several hazardous waste sites located adjacent to corridor. Greatest concentration of sites located in the cities of Norwalk and La Mirada.	Several hazardous waste sites located adjacent to corridor, but the fewest sites in total compared to the other alignment options within Segment B. The concentration of sites is located in the northern portion of the City of Downey.	Several hazardous waste sites located adjacent to corridor, but the fewest sites in total compared to the other alignment options within Segment B. The concentration of sites is located in the northern portion of the City of Downey.
	2	2	3	3	3

1 2 3 4 5
Highly Unfavorable Highly Favorable

Table 2-H-20 continued
Los Angeles to San Diego via Orange County – High-Speed Train Alignment Evaluation Matrix
Segment C – Orange County to Oceanside

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high-end improvements	Interstate 5 Freeway	San Joaquin Corridor (SR-73) with I-5	Interstate 5 and Foothill Corridor (SR-241)
<i>Maximize Ridership/Revenue Potential.</i>					
Travel Time (Exp. = Express)	(Local) Anaheim to: Santa Ana – 6.6 min ITC – 14.7 min San Juan Cap. – 23.9 min OTC – 43.6 min	(Local) Anaheim to: ITC – 11.2 min OTC – 38.5 min	(Local) Anaheim to: Irvine – 9 min Oceanside – 35.9 min	(Local) Garden Grove to: Newport Bch – 9.4 min Oceanside – 37.5 min	(Local) Anaheim to: Irvine – 8.9 min Oceanside – 39.8 min
	(Exp.) Anaheim to: OTC – 33.9 min	(Exp.) Anaheim to: OTC – 32.1 min	(Exp.) Anaheim to: Oceanside – 33.7 min	(Exp.) Garden Grove to: Oceanside – 34.5 min	(Exp.) Anaheim to: Oceanside – 36.6 min
	3	3	4	4	3
Length	55.5 miles (89.3 km)	56.1 miles (90.3 km)	55.1 miles (88.6 km)	57.6 miles (92.7 km)	60.6 miles (97.5 km)
	3	3	3	3	2
Population & Employment Catchment	See Irvine and Oceanside Station options	See Irvine and Oceanside Station options 9	See Irvine and Oceanside Station options	See Newport Beach and Oceanside Station options	See Irvine and Oceanside Station options
	3	3	3	3	3
<i>Maximize Connectivity and Accessibility.</i>					
Intermodal Connections	See Irvine and Oceanside Station options	See Irvine and Oceanside Station options	See Irvine and Oceanside Station options	See Newport Beach and Oceanside Station options	See Irvine and Oceanside Station options
	4	4	3	2	3
<i>Minimize Operating and Capital Costs.</i>					
Length	55.5 miles (89.3 km)	56.1 miles (90.3 km)	55.1 miles (88.6 km)	57.6 miles (92.7 km)	60.6 miles (97.5 km)
	3	3	3	3	2

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high-end improvements	Interstate 5 Freeway	San Joaquin Corridor (SR-73) with I-5	Interstate 5 and Foothill Corridor (SR-241)
Operational Issues	<p>Shared-use alignment, subject to delays from other rail traffic.</p> <p>The alignment is of medium length. It contains three curves with 50 mph (80 km/h) speed restrictions, and many 75 mph (120 km/h) speed restrictions.</p>	<p>Shared-use alignment, subject to delays from other rail traffic.</p> <p>Tunnels under Orange and Dana Point require 2% (approx.) transitions to/from grade, which slows freight operation in the corridor</p> <p>Bypasses in southern part of alignment avoid speed restrictions and reduced simulated trip time.</p>	<p>The length of this alignment is about the same as alignment Option C1B. It has one 50 mph (80 km/h) speed restriction and several 75 mph (120 km/h) speed restrictions.</p> <p>Dedicated VHS alignment</p>	<p>This alignment has the shortest simulated trip time. There are no 50 mph (80 km/h) speed restrictions. However, there are many 75 mph (120 km/h) speed restrictions.</p> <p>Dedicated VHS alignment</p>	<p>This option has the longest distance and the second longest trip times.</p> <p>Due to moderately steep grades, this option would only be suitable for dedicated VHS or maglev operation.</p> <p>Dedicated VHS alignment</p>
	2	2	3	3	3
Construction Issues	<p>Most of this alignment is unaffected, or has double tracking.</p> <p>The tunnel under San Juan Capistrano is challenging due to the narrow alignment, proximity to historic station, and nearby water crossings.</p> <p>Beach access issues at grade separations in San Clemente.</p>	<p>Similar to Option C1a, but with more tunnels.</p> <p>Tunnels are required under Orange and Dana Point to allow curve straightening. Tunnel in Orange affects the existing Metrolink station.</p> <p>Tunnel under I-5 in San Clemente, from Pico to Christianitos, due to rolling profile of freeway</p>	<p>General freeway construction issues (Option A1).</p> <p>Third level aerial construction along I-5 from Santa Ana River to SR-55, due to numerous overcrossings – HOV lane structures in the median may require rail system to straddle part of the freeway. Also at other freeway interchanges and in Oceanside.</p> <p>Tunnel under I-5 in San Clemente, from Las Ramblas to Christianitos, due to rolling profile of freeway.</p>	<p>General freeway construction issues (Option A1).</p> <p>SARC section highly constrained by flood control channel, power lines, & utility trunk lines.</p> <p>System must be in trench to pass beneath John Wayne Airport glide path</p> <p>Two long tunnel segments required under SR-73 alignment, due to sustained 6% grades in San Joaquin Hills</p> <p>Same as Option C2 from San Juan Capistrano to Oceanside.</p>	<p>General freeway construction issues (Option A1).</p> <p>Tunnel just north of Arroyo Trabuco due to steep grades.</p> <p>From Oso Parkway to I-5 (San Onofre) the corridor is one of several proposals being studied as an extension for SR-241, if highway is not built, then substantial earthwork required for this option.</p> <p>Same as Option C2 from Anaheim to Irvine and from San Onofre to Oceanside.</p>
	4	3	1	2	3

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high-end improvements	Interstate 5 Freeway	San Joaquin Corridor (SR-73) with I-5	Interstate 5 and Foothill Corridor (SR-241)
Capital Cost	Least Cost	Moderate Cost	Very High Cost	Highest Cost	Very High Cost
	4	3	1	1	1
Right-of-Way Issues/Cost	Existing LOSSAN corridor, some widening required but new alignment is mostly in covered trench	Existing LOSSAN Corridor, some widening, other segments are trench or tunnel bypasses	Most of the freeway alignment from Anaheim to San Onofre is constrained Through Camp Pendleton, all land adjacent to I-5 could be subject to approval by the Department of the Navy.	Highly constrained along SARC and I-405. SR-73/I-5 alignments from Aliso Viejo to San Onofre are constrained. Through Camp Pendleton, all land adjacent to I-5 could be subject to approval by the Department of the Navy.	Freeway median constrained on I-5 through Santa Ana, Tustin, and Irvine. Open land on much of SR- 241, south of Oso Parkway. Through Camp Pendleton, all land adjacent to I-5 could be subject to approval by the Department of the Navy.
	4	4	2	3	3
<i>Maximize Compatibility with Existing and Planned Development.</i>					
Land Use Compatibility and Conflicts	Low to medium density residential with mixture of commercial, industrial, and open space. Anaheim stadium, some parks, two military bases and San Juan Capistrano Mission and Historic Town Center Park is located along the alignment option.	Low to medium density residential with mixture of commercial, industrial, and open space. Anaheim stadium, some parks, two military bases and San Juan Capistrano Mission and Historic Town Center Park is located along the alignment option.	Low to medium density residential with mixture of commercial, industrial, and open space. Anaheim stadium, Disneyland theme park, city parks, two military bases and San Juan Capistrano Mission and Historic Town Center Park is located near the alignment option.	Land Uses are generally the same as described in Alignment Option C1a with the addition of John Wayne airport and large segments of open space along the corridor. South of the SR-73/I-5 interchange, land uses are the same as Option C2.	The alignment option transverses large agricultural lands and open space with large tracts of residential developments occurring along the corridor. There is also the San Onofre nuclear power plant and Camp Pendleton U.S. Marine Corps base.
	2	2	3	3	4

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high-end improvements	Interstate 5 Freeway	San Joaquin Corridor (SR-73) with I-5	Interstate 5 and Foothill Corridor (SR-241)
Visual Quality Impacts	Option is an existing alignment, at or below grade. Visual impacts vary from heavy urbanized areas of central Orange County to residential, open space, and farmland of southern Orange County. Views south of the Orange/San Diego County line is dominated by the Pacific Ocean to the West. Views in the vicinity of Camp Pendleton are of rolling hills of natural vegetation.	Visual impacts are similar to Option C1a. Bypasses are mostly in tunnel, reducing impact, but electrification has more impact in other locations.	Visual impacts are similar to Option C1a. New aerial structure added to I-5 alignment from Anaheim to Dana Point, and in Oceanside.	Introduction of aerial structure into freeway and full highway alignments, except at-grade in Camp Pendleton. Visual impacts along the Santa Ana River include riparian and natural wildlife habitat, and areas of residential and commercial adjacent to the River. The views from I-405 are of office and commercial development. Views from SR-73 are a mixture of residential and undeveloped open space. Some impacts mitigated by tunnels.	Introduction of aerial structure into freeway and full highway alignments, except at-grade in Camp Pendleton. Visual impacts from SR-241 are a mixture of residential and office/commercial developments. As the alignment transitions to the south, the view become less residential and more undeveloped open space and rolling hills of natural vegetation.
	3	3	2	3	2
<i>Minimize Impacts to Natural Resources.</i>					
Wetland Impacts	Wetland areas known to occur within this segment are 3 rivers, 2 washes, and 10 creeks.	Wetland areas known to occur within this segment are 3 rivers, 2 washes, and 10 creeks.	Wetland areas known to occur within this segment are 3 rivers, 1 channel, 2 washes, and 10 creeks.	Wetland areas known to occur within this segment are 3 rivers, 5 channels, 2 washes, and 13 creeks.	Wetland areas known to occur within this segment are 2 rivers, 1 channel, 1 reservoir, 1 lake, 2 washes, and 15 creeks.
Sites/Area	26/10 ac	26/10 ac	21/11.2 ac	22/12.0 ac	20/12.4 ac
	2	2	2	2	1
Water Resources	Impacts to 22 water resources. (1,100 linear ft)	Impacts to 22 water resources. (1,100 linear ft)	Impacts to 17 water resources. (850 linear ft)	Impacts to 14 water resources. (700 linear ft)	Impacts to 23 water resources. (1,150 linear ft)
	2	2	2	2	2
Floodplain Impacts	Crosses numerous floodplains.	Crosses numerous floodplains.	Crosses 4 floodplains	Crosses 4 floodplains	Crosses 4 floodplains
	2	2	2	2	2

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high-end improvements	Interstate 5 Freeway	San Joaquin Corridor (SR-73) with I-5	Interstate 5 and Foothill Corridor (SR-241)
Threatened & Endangered Species Impacts	There are 6 endangered, 2 threatened, and 19 species of special concern located within this option.	There are 6 endangered, 2 threatened, and 19 species of special concern located within this option.	There are 6 endangered, 2 threatened, and 19 species of special concern located within this option.	There is 1 endangered, 2 threatened, and 4 species of special concern located within this option.	There are 4 endangered, 2 threatened, and 15 species of special concern located within this option.
	2	2	2	3	2
<i>Minimize Impacts to Social and Economic Resources.</i>					
Environmental Justice Impacts (Demographics)	Potential impacts to a minority population of approximately 17,275 people. There are no potential impacts to any low-income households.	Potential impacts to a minority population of approximately 17,275 people. There are no potential impacts to any low-income households.	Potential impacts to a minority population of approximately 13,700 people. There are no potential impacts to any low-income households.	There are no potential impacts to any minority population or low-income households.	Potential impacts to a small minority population of approximately 50 people. There are no potential impacts to any low-income households.
	4	4	4	5	5
Community & Neighborhood Impacts	There are impacts to 13 communities and neighborhoods that occur within this alignment option.	There are impacts to 13 communities and neighborhoods that occur within this alignment option.	There are impacts to 15 communities and neighborhoods that occur within this alignment option.	There are impacts to 12 communities and neighborhoods that occur within this alignment option.	There are impacts to 5 communities and neighborhoods that occur within this alignment option. Fewest impacts, as much of the alignment is open land.
	2	3	3	3	4
Farmland Impacts	There are several parcels of farmland within Orange County. There is 1 parcel of Prime Farmland located within San Diego County.	There are several parcels of farmland within Orange County. There is 1 parcel of Prime Farmland located within San Diego County.	There are several parcels of farmland within Orange County. There is 1 parcel of Prime Farmland located within San Diego County.	There is 1 parcel of Farmland of Statewide Importance located within Orange County in the vicinity of SR-73.	There are several parcels of farmland within Orange and San Diego County.
	4	4	4	5	4

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high-end improvements	Interstate 5 Freeway	San Joaquin Corridor (SR-73) with I-5	Interstate 5 and Foothill Corridor (SR-241)
<i>Minimize Impacts to Cultural Resources.</i>					
Cultural Resources Impacts	There are several sites of cultural or historic significance that occur adjacent to this alignment option.	There are several sites of cultural or historic significance that occur adjacent to this alignment option.	There are several sites of cultural or historic significance that occur adjacent to this alignment option.	2 sites of cultural or historic significance occur along this alignment option.	There are several sites of cultural or historic significance that occur adjacent to this alignment option. There are no sites in the vicinity of planned segments of SR-241.
	2	3	3	4	3
Parks & Recreation/Wildlife Refuge Impacts	There are 23 Parks and Recreation/ Wildlife Refuge resources that occur within this alignment option.	There are 18 Parks and Recreation/ Wildlife Refuge resources that occur within this alignment option.	There are 2 Parks and Recreation/Wildlife Refuge resources that occur within this alignment option.	There are 7 Parks and Recreation/Wildlife Refuge resources that occur within this alignment option.	There are 2 Parks and Recreation/Wildlife Refuge resources that occur within this alignment option.
	1	2	4	3	4
<i>Maximize Avoidance of Areas with Geologic and Soils Constraints.</i>					
Soils/Slope Constraints	There are 9 distinct soil types. The alignment crosses areas with the potential for liquefaction and landslides.	The Soils and Slope Constraints are similar to Option C1a.	The Soils and Slope Constraints are similar to Option C1a.	The Soils and Slope Constraints are similar to Option C1a.	The Soils and Slope Constraints are similar to Option C1a.
	3	3	3	3	3
Seismic Constraints	Potential impacts from 1 major seismic area and fault. No faults are crossed.	The Seismic Constraints are similar to Option C1a.	The Seismic Constraints are similar to Option C1a.	The Seismic Constraints are similar to Option C1a.	The Seismic Constraints are similar to Option C1a.
	3	3	3	3	3

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high-end improvements	Interstate 5 Freeway	San Joaquin Corridor (SR-73) with I-5	Interstate 5 and Foothill Corridor (SR-241)
<i>Maximize Avoidance of Areas with Potential Hazardous Materials.</i>					
Hazardous Materials/Waste Constraints	Several hazardous waste sites located adjacent to corridor. Greatest concentration of sites located in the cities of Tustin and Santa Ana.	Several hazardous waste sites located adjacent to corridor. Greatest concentration of sites located in the cities of Tustin and Santa Ana. There are no known sites south of San Clemente along this alignment option.	Several hazardous waste sites located adjacent to corridor. Greatest concentration of sites located in the cities of Anaheim, Tustin, Irvine, and Mission Viejo. There are no known sites south of Mission Viejo along this alignment option.	No known hazardous waste sites.	No known hazardous waste sites.
	2	2	2	5	5

1 2 3 4 5
Highly Unfavorable Highly Favorable

Table 2-H-20 continued
Los Angeles to San Diego via Orange County – High-Speed Train Alignment Evaluation Matrix
Segment D – Oceanside to San Diego

Alignment = Alignment Carried Forward **Alignment** = Alignment Eliminated **2** = Primary or Secondary Reason for Elimination

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high- end improvements	Interstate 5 Freeway
<i>Maximize Ridership/Revenue Potential.</i>			
Travel Time (Exp. =Express)	(Local) OTC to: Solana Beach – 10.8 min UTC – 19.4 min Santa Fe Depot – 30.9 min	(Local) OTC to: Solana Beach – 10 min Santa Fe Depot – 27.1 min	(Local) Oceanside to: Solana Beach – 10.8 min San Diego Airport – 24.3 min
	(Exp.) OTC to: Santa Fe Depot – 24.5 min	(Exp.) OTC to: Santa Fe Depot – 23.2 min	(Exp.) Oceanside to: San Diego Airport – 21.4 min
	3	4	4
Length	37.3 miles (60.0 km)	35.8 miles (57.7 km)	33.8 miles (54.5 km)
	3	3	3
Population & Employment Catchment	See Solana Beach and UTC and Santa Fe Station options	See Solana Beach and Santa Fe Station options	See Solana Beach and San Diego Airport Station options
	3	3	3
<i>Maximize Connectivity and Accessibility.</i>			
Intermodal Connections	See Solana Beach and UTC and Santa Fe Depot Station options	See Solana Beach and Santa Fe Depot Station options	See Solana Beach and San Diego Airport Station options
	4	3	2
<i>Minimize Operating and Capital Costs.</i>			
Length	37.3 miles (60.0 km)	35.8 miles (57.7 km)	33.8 miles (54.5 km)
	3	3	3

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high- end improvements	Interstate 5 Freeway
Operational Issues	<p>This alignment is the longest in this segment and has the longest trip time.</p> <p>Shared-Use, subject to delays from other rail traffic.</p>	<p>This alignment is shorter and has one 50 mph (80 km/h) speed restriction and several 75-100 mph (120-160 km/h) speed restrictions. The simulated trip time is substantially shorter.</p> <p>Shared-Use, bypasses would reduce delay compared with D1a.</p>	<p>The alignment characteristics are very similar to the Option D1b with identical simulated trip times. The alignment has many 75 mph (120 km/h) speed restrictions.</p> <p>Dedicated VHS alignment.</p>
	2	3	4
Construction Issues	<p>Completion of double tracking (at-grade) and stabilization and reinforcement at Del Mar Bluffs.</p> <p>Deep tunnel under Miramar Hill from Sorrento Valley to Rose Canyon.</p>	<p>Grade-separation of double tracked system in coastal cities.</p> <p>Trench construction in cities require transitions to/from grade at each Lagoon crossing. Some Coaster stations would need new platforms if tracks were lowered.</p> <p>Tunnel under Camino Del Mar difficult due to commercial/tourist area and traffic on highway. Second tunnel would follow I-5 alignment from north of Sorrento Valley Coaster to vicinity of Gilman Drive interchange</p> <p>Numerous grade crossings south of San Diego River Channel, trench required in approach to Santa Fe Depot due to airport runway.</p>	<p>General issues associated with a freeway alignment (See Option A1).</p> <p>Third level structures to clear arterial overpasses and freeway interchanges (SR-58, SR-56, I-805, SR-52, I-8)</p> <p>To avoid tunnel in Miramar Hill segment (road climbs at ~3.3% on north side), the option assumes very high structure above the arterials that crossover I-5.</p>
	2	1	1
Capital Cost	Least Cost	Very High Cost	Very High Cost
	4	2	2

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high- end improvements	Interstate 5 Freeway
Right-of-Way Issues/Cost	Existing LOSSAN Corridor, with some widening, except for the new tunnel under UTC. 3	Existing LOSSAN Corridor, with some widening, except for the new tunnels at Del Mar and under I-5. 3	Highly constrained due to build out of I-5. 1
<i>Maximize Compatibility with Existing and Planned Development.</i>			
Land Use Compatibility and Conflicts	Land uses are a mixture of agricultural, residential, and commercial with numerous state beaches, parks, and open space located along this alignment option. 2	Land uses are a mixture of agricultural, residential, and commercial with numerous state beaches, parks, and open space located along this alignment option. 3	Land uses are the same as described in Option D1a. 2
Visual Quality Impacts	Widening of existing rail alignment. Views south of Oceanside are dominated by the Pacific Ocean to the west. There is a mixture of residential, commercial development, farmlands, and open space. In the vicinity of downtown San Diego, the views are of heavy urbanization. 2	Visual impacts similar to Option D1a, but impacts mitigated by grade-separation in coastal cities, and by tunnel at Del Mar. 3	Visual impacts similar to Option C2, impacts due to high aerial structure on I-5 alignment. 3
<i>Minimize Impacts to Natural Resources.</i>			
Wetland Impacts	Wetland areas known to occur within this segment are 1 river, 1 river floodway, 4 lagoons, 5 creeks, and 1 bay.	Wetland areas known to occur within this segment are 1 river, 1 river floodway, 4 lagoons, 5 creeks, and one bay.	Wetland areas known to occur within this segment are 1 river, 1 river floodway, 4 lagoons, 8 creeks, and one bay.
Sites/Area	60/42.9 ac	40/29.5 ac	24/10.3 ac
	2	2	2
Water Resources	Impacts to 13 water resources. (650 linear ft)	Impacts to 13 water resources. (650 linear ft)	Impacts to 13 water resources. (650 linear ft)
	2	2	2

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high- end improvements	Interstate 5 Freeway
Floodplain Impacts	Crosses several 100-Year floodplains. 2	Crosses several 100-Year floodplains. 2	Crosses several 100-Year floodplains. 2
Threatened & Endangered Species Impacts	There are 8 endangered, 5 threatened, and 24 species of special concern located within this option. 1	There are 8 endangered, 5 threatened, and 24 species of special concern located within this option. 1	There are 8 endangered, 5 threatened, and 24 species of special concern located within this option. 1
<i>Minimize Impacts to Social and Economic Resources.</i>			
Environmental Justice Impacts (Demographics)	Potential impacts to minority population of approximately 5,250 people and potential impacts to approximately 45 low-income households. 4	Potential impacts to minority population of approximately 5,250 people and potential impacts to approximately 45 low-income households. 4	Potential impacts to minority population of approximately 8,950 people. There are no potential impacts to any low-income households. 4
Community & Neighborhood Impacts	There are impacts to 7 communities and neighborhoods within this alignment option. 2	There are impacts to 7 communities and neighborhoods within this alignment option. 3	There are impacts to 7 communities and neighborhoods within this alignment option. 3
Farmland Impacts	There are several parcels farmland located within San Diego County along this alignment option. 3	There are several parcels farmland located within San Diego County along this alignment option. 3	There are several parcels farmland located within San Diego County along this alignment option. 3
<i>Minimize Impacts to Cultural Resources.</i>			
Cultural Resources Impacts	There are several sites of cultural or historic significance that occur adjacent to the alignment including the Carlsbad Village Depot and Old Town San Diego. 2	There are several sites of cultural or historic significance that occur adjacent to the alignment including the Carlsbad Village Depot and Old Town San Diego. 2	There are several sites of cultural or historic significance that occur adjacent to the alignment including the Carlsbad Village Depot and Old Town San Diego. 2

Evaluation Criteria	LOSSAN Corridor – low-end improvements (Conventional only)	LOSSAN Corridor – high- end improvements	Interstate 5 Freeway
Parks & Recreation/Wildlife Refuge Impacts	There are 14 Parks and Recreation/Wildlife Refuge resources that occur within this alignment option. 2	There are 12 Parks and Recreation/Wildlife Refuge resources that occur within this alignment option. 2	There are 15 Parks and Recreation/Wildlife Refuge resources that occur within this alignment option. 2
<i>Maximize Avoidance of Areas with Geologic and Soils Constraints.</i>			
Soils/Slope Constraints	There are 7 distinct soil types. The potential for liquefaction and landslides along the alignment option in the cities of Del Mar, Solana Beach, and Encinitas. 2	The Soils and Slope Constraints are similar to Option D1a. 3	The Soils and Slope Constraints are similar to Option D1a. 3
Seismic Constraints	Potential impacts from 1 major seismic area and fault occur within this alignment option. 2	The Seismic Constraints are similar to Option D1a. 2	The Seismic Constraints are similar to Option D1a. 2
<i>Maximize Avoidance of Areas with Potential Hazardous Materials.</i>			
Hazardous Materials/Waste Constraints	Several hazardous waste sites located adjacent to corridor. The sites are located in the cities of Oceanside, Carlsbad, Encinitas, and San Diego with the greatest concentration located within San Diego along the alignment. 2	Several hazardous waste sites located adjacent to corridor. The sites are located in the cities of Oceanside, Carlsbad, Encinitas, and San Diego with the greatest concentration located within San Diego along this alignment. 2	Several hazardous waste sites located adjacent to corridor in the cities of Oceanside and San Diego with the greatest concentration located within Diego along this alignment option. 3

Table 2-H-20 continued
Los Angeles to San Diego via Orange County – High-Speed Train Station Evaluation Matrix
LA Union Station to LAX

Station Name = Station Carried Forward

Station Name = Station Eliminated

Evaluation Criteria	LAX	LA Union Station
<i>Maximize Ridership/Revenue Potential.</i>		
Travel Time	Refer to Options A1-A3 and A5	Refer to Options A1-A3 and B1-B4
Population & Employment Catchment <i>Data Based on 2020 Forecasts</i>	Population: 3,299,933 persons Employment: 1,837,949 persons	Population: 4,548,087 persons Employment: 2,021,767 persons
	3	5
Intermodal Connections	<ul style="list-style-type: none"> I-405 I-105 Arterials MTA Buses Culver City Transit Santa Monica Big Blue Bus Torrance Transit <i>For details refer to Intermodal Connections in Section 4.1.1</i>	<ul style="list-style-type: none"> LAX – 12 mi. (19.2 km) I-110 US-101 Arterials Amtrak Amtrak Connection Buses MTA Buses LADOT DASH Foothill Transit MTA Rail Metrolink <i>For details refer to Intermodal Connections in Section 4.1.1</i>
	4	5
<i>Minimize Operating and Capital Costs.</i>		
Operational Issues	No operational issues.	Shared-use with Amtrak, Metrolink, and statewide VHS/Maglev system.
	4	2
Construction Issues	Proximity to airport	<i>Refer to Los Angeles - Bakersfield Screening Evaluation Report.</i>
	2	2

Evaluation Criteria	LAX	LA Union Station
Capital Cost	New Terminal station	Existing Station; part of other corridors
	2	3
Right-of-Way Issues/Cost	Limited available land due to airport terminals, parking, flight path restrictions.	Existing station would be enlarged
	2	2
<i>Maximize Compatibility with Existing and Planned Development.</i>		
Land Use Compatibility and Conflicts	Land use is heavy commercial, industrial, and transportation related uses. Residential area to the east of proposed station site, across from I-405.	Land use is common to heavy urbanization of downtown urban centers with a mixture of heavy office space, light industrial, and mixed commercial use.
	4	4
Visual Quality Impacts	Visual impacts around proposed station include areas of heavy urbanization including mixed residential, commercial, industrial, and freeways. Few areas of open space and natural vegetation proposed station location.	Visual impacts around LA Union Station include areas of heavy urbanization including commercial, industrial, office space, and freeways. Few areas of open space and natural vegetation occur around LA Union Station.
	4	4
<i>Minimize Impacts to Natural Resources.</i>		
Wetland Impacts	No wetland impacts.	No wetland impacts.
	5	5
Water Resources	No water resource impacts.	No water resource impacts.
	5	5
Floodplain Impacts	No 100-year floodplain zone impacts.	No 100-year floodplain zone impacts.
	5	5

Evaluation Criteria	LAX	LA Union Station
Threatened & Endangered Species Impacts	Impacts to 1 endangered species from this station.	No impacts to any sensitive species.
	5	5
<i>Minimize Impacts to Social and Economic Resources.</i>		
Environmental Justice Impacts (Demographics)	No known impacts to any minority population and no known impacts to low-income households.	Potential impacts to a minority population of approximately 22 people. No known impacts to low-income households.
	5	5
Community & Neighborhood Impacts	The cities of Los Angeles, Hawthorne and Inglewood and the communities of Lennox and Del Aire are impacted. Impacts to each city or community would depend upon proposed station site and location.	The City of Los Angeles and the downtown district of Chinatown are impacted. No impacts anticipated because LA Union Station is an operational rail station in current use.
	3	3
Farmland Impacts	No farmland impacts.	No farmland impacts.
	5	5
<i>Minimize Impacts to Cultural Resources.</i>		
Cultural Resources Impacts	No known cultural or historical sites.	3 cultural resources occur in the immediate vicinity.
	5	3
Parks & Recreation/Wildlife Refuge Impacts	No Parks or Recreation/Wildlife Refuge resources.	There is 1 Park that occurs in the immediate vicinity of the station.
	5	5

Evaluation Criteria	LAX	LA Union Station
<i>Maximize Avoidance of Areas with Geologic and Soils Constraints.</i>		
Soils/Slope Constraints	2 distinct soil types occur within the area of the proposed station. Possible impacts from liquefaction also occur in the immediate vicinity.	There is 1 distinct soil type. Possible impacts from liquefaction and landslides also occur in the immediate vicinity.
	3	3
Seismic Constraints	There are potential impacts from 3 major seismic areas and faults.	There are potential impacts from 3 major seismic areas and faults.
	3	3
<i>Maximize Avoidance of Areas with Potential Hazardous Materials.</i>		
Hazardous Materials/Waste Constraints	No known hazardous material/waste sites in the immediate vicinity.	No known hazardous material/waste sites in the immediate vicinity.
	5	5

1 2 3 4 5
Highly Unfavorable Highly Favorable

Table 2-H-20 continued
Los Angeles to San Diego via Orange County – High-Speed Train Station Evaluation Matrix
LA Union Station to Central Orange County (Anaheim) – Southeast LA Stations
Station Name = Station Carried Forward Station Name = Station Eliminated

Evaluation Criteria	Norwalk (Metrolink)	Norwalk – I-5 at Imperial Highway	Norwalk – UPRR at Imperial Highway	Paramount
<i>Maximize Ridership/Revenue Potential.</i>				
Travel Time				
Population & Employment Catchment <i>Data Based on 2020 Forecasts</i>	Population: 3,085,202 persons Employment: 1,460,673 persons	Population: 3,230,260 persons Employment: 1,468,155 persons	Population: 3,269,933 persons Employment: 1,436,802 persons	Population: 3,713,693 persons Employment: 1,616,168 persons
	3	3	3	4
<i>Maximize Connectivity and Accessibility.</i>				
Intermodal Connections	<ul style="list-style-type: none"> Long Beach Aprt –8mi. (12.8 km) I-5 Arterials Amtrak MTA Buses Norwalk Transit Metrolink 	<ul style="list-style-type: none"> Long Beach Aprt – 8mi. (12.8 km) I-5 Arterials MTA Buses Norwalk Transit 	<ul style="list-style-type: none"> Long Beach Aprt – 7mi. (11.2 km) I-5 I-605 I-105 Arterials MTA Buses Norwalk Transit 	<ul style="list-style-type: none"> Long Beach Aprt – 6mi. (9.6 km) I-105 I-710 Arterials MTA Buses Potential LRT station–MTA Green Line
	5	4	4	4
<i>Minimize Operating and Capital Costs.</i>				
Operational Issues	Shared-use with Amtrak and Metrolink	Dedicated Station (New)	Dedicated Station (New)	Dedicated Station (New)
	3	4	4	4
Construction Issues	Expansion of existing station	Aerial station above I-5 Freeway	Trench platforms, station at grade	Aerial station with potential connection to light rail station in I-105 trench.
	4	3	3	2

Evaluation Criteria	Norwalk (Metrolink)	Norwalk – I-5 at Imperial Highway	Norwalk – UPRR at Imperial Highway	Paramount
Capital Cost	Some cost offset by existing station.	New station	New station	New station + Green Line platform
	4	3	3	2
Right-of-Way Issues/Cost	Existing facility, nearby vacant land	Constrained by freeway	Constrained by residential area to south.	Constrained by wide freeway trench below station.
	3	2	2	2
<i>Maximize Compatibility with Existing and Planned Development.</i>				
Land Use Compatibility and Conflicts	Land use is heavy urbanization with a mixture of residential, commercial, and light industrial.	Land use is heavy urbanization with a mixture of residential, commercial, and light industrial.	Land use is heavy urbanization with a mixture of residential, commercial, and light industrial.	Land use is heavy urbanization with a mixture of residential, commercial, and industrial.
	4	3	3	2
Visual Quality Impacts	Visual impacts around proposed station include areas of heavy urbanization including mixed residential, commercial, industrial, utility lines and freeways. Few areas of open space and natural vegetation in the vicinity of the proposed station location.	Visual impacts around proposed station include areas of heavy urbanization including mixed residential, commercial, industrial, utility lines and freeways. Few areas of open space and natural vegetation in the vicinity of the proposed station location.	Visual impacts around proposed station include areas of heavy urbanization including mixed residential, commercial, industrial, utility lines and freeways. Few areas of open space and natural vegetation in the vicinity of the proposed station location.	Visual impacts around proposed station include areas of heavy urbanization including mixed residential, commercial, industrial, utility lines and freeways. Few areas of open space and natural vegetation in the vicinity of the proposed station location.
	4	3	3	2
<i>Minimize Impacts to Natural Resources.</i>				
Wetland Impacts	No wetland impacts.	No wetland impacts.	No wetland impacts.	No wetland impacts.
	5	5	5	5
Water Resources	No water resource impacts.	No water resource impacts.	No water resource impacts.	No water resource impacts.
	5	5	5	5
Floodplain Impacts	No floodplain impacts.	No floodplain impacts.	No floodplain impacts.	No floodplain impacts.
	5	5	5	5

Evaluation Criteria	Norwalk (Metrolink)	Norwalk – I-5 at Imperial Highway	Norwalk – UPRR at Imperial Highway	Paramount
Threatened & Endangered Species Impacts	No impacts to any sensitive species.	No impacts to any sensitive species.	No impacts to any sensitive species.	No impacts to any sensitive species.
	5	5	5	5
<i>Minimize Impacts to Social and Economic Resources.</i>				
Environmental Justice Impacts (Demographics)	Potential impacts to a minority population of approximately 3,300 people and known impacts to 5 low-income households.	Potential impacts to a minority population of approximately 2,800 people. No known impacts to any low-income households.	Potential impacts to a minority population of approximately 2,800 people and known impacts to 5 low-income households.	Potential impacts to a minority population of approximately 3,250 people. No known impacts to any low-income households.
	2	2	2	2
Community & Neighborhood Impacts	The cities of Norwalk and Santa Fe Springs would be impacted. Impacts to either city would depend upon proposed station site and location.	The cities of Norwalk and Santa Fe Springs would be impacted. Impacts to either city would depend upon proposed station site and location.	The cities of Norwalk and Santa Fe Springs would be impacted. Impacts to either city would depend upon proposed station site and location.	The cities of Paramount and South Gate and the community of Hollydale would be impacted. Impacts to either city would depend upon proposed station site and location.
	4	3	3	2
Farmland Impacts	No farmland impacts.	No farmland impacts.	No farmland impacts.	No farmland impacts.
	5	5	5	5
<i>Minimize Impacts to Cultural Resources.</i>				
Cultural Resources Impacts	No cultural resources.	No cultural resources.	No cultural resources.	No cultural resources.
	5	5	5	5
Parks & Recreation/Wildlife Refuge Impacts	No Parks or Recreation/Wildlife Refuge resources.	No Parks or Recreation/Wildlife Refuge resources.	No Parks or Recreation/Wildlife Refuge resources.	No Parks or Recreation/Wildlife Refuge resources.
	5	5	5	5
<i>Maximize Avoidance of Areas with Geologic and Soils Constraints.</i>				
Soils/Slope Constraints	There is 1 distinct soil type. Possible impacts from liquefaction in the immediate vicinity.	There is 1 distinct soil type. Possible impacts from liquefaction in the immediate vicinity.	There is 1 distinct soil type. Possible impacts from liquefaction in the immediate vicinity.	There is 1 distinct soil type. Possible impacts from liquefaction in the immediate vicinity.
	3	3	3	3

Evaluation Criteria	Norwalk (Metrolink)	Norwalk – I-5 at Imperial Highway	Norwalk – UPRR at Imperial Highway	Paramount
Seismic Constraints	There are potential impacts from 3 major seismic areas and faults. 3	There are potential impacts from 3 major seismic areas and faults. 3	There are potential impacts from 3 major seismic areas and faults. 3	There are potential impacts from 3 major seismic areas and faults. 3
<i>Maximize Avoidance of Areas with Potential Hazardous Materials.</i>				
Hazardous Materials/Waste Constraints	There are 2 known hazardous material/waste sites in the immediate vicinity. 4	No known hazardous material/waste sites. 5	No known hazardous material/waste sites. 5	No known hazardous material/waste sites. 5

1 2 3 4 5
Highly Unfavorable Highly Favorable

Table 2-H-20 continued
Los Angeles to San Diego via Orange County – High-Speed Train Station Evaluation Matrix
LA Union Station to Central Orange County (Anaheim) – Central Orange County Stations
Station Name = Station Carried Forward **Station Name** = Station Eliminated

Evaluation Criteria	Anaheim (Edison Field/Metrolink)	Anaheim – Interstate 5	Garden Grove
<i>Maximize Ridership/Revenue Potential.</i>			
Travel Time			
Population & Employment Catchment <i>Data Based on 2020 Forecasts</i>	Population: 2,456,616 persons Employment: 1,455,235 persons 3	Population: 2,588,844 persons Employment: 1,484,922 persons 3	Population: 2,628,764 persons Employment: 1,546,843 persons 3
<i>Maximize Connectivity and Accessibility.</i>			
Intermodal Connections	<ul style="list-style-type: none"> • John Wayne – 9mi. (14.4 km) • I-5 • SR-57 • Arterials • Amtrak • OCTA Buses • Anaheim Resort Shuttles • Metrolink 5	<ul style="list-style-type: none"> • John Wayne – 8.5mi. (13.6 km) • I-5 • Arterials • OCTA Buses 4	<ul style="list-style-type: none"> • John Wayne – 6.5mi. (10.4 km) • SR-22 • Arterials • OCTA Buses 3
<i>Minimize Operating and Capital Costs.</i>			
Operational Issues	Shared-use with Amtrak and Metrolink. 3	New VHS/Maglev Station 4	New VHS/Maglev Station 4
Construction Issues	Expand existing station, replace station building. 4	New station - aerial 3	New station - below grade platforms. 3

Evaluation Criteria	Anaheim (Edison Field/Metrolink)	Anaheim – Interstate 5	Garden Grove
Capital Cost	Some cost off set by existing station. 4	New station - aerial platforms 2	New station - below grade platforms. 2
Right-of-Way Issues/Cost	Existing facility; nearby parking lot 4	Constrained ROW 2	Constrained ROW 2
<i>Maximize Compatibility with Existing and Planned Development.</i>			
Land Use Compatibility and Conflicts	Land use is mixed commercial, light industrial, office space, and recreational with some areas of open space. 4	Land use is mixed commercial, light industrial, office space, and recreational with some areas of open space. 3	Land use is mixed commercial, light industrial, office space with some areas of open space, and residential. 2
Visual Quality Impacts	Visual impacts around proposed station include areas of urbanization including mixed commercial, industrial, utility lines, freeways and Anaheim stadium. Few areas of open space and natural vegetation in the vicinity of the proposed station location except for along the Santa Ana river. 4	Visual impacts around proposed station include areas of urbanization including mixed commercial, industrial, utility lines, freeways, Anaheim stadium and The Block of Orange. Few areas of open space and natural vegetation in the vicinity of the proposed station location except for along the Santa Ana river. 3	Visual impacts around proposed station include areas of urbanization including mixed residential, commercial, industrial, utility lines, and freeways. Few areas of open space and natural vegetation in the vicinity of the proposed station location except for along the Santa Ana river. 2
<i>Minimize Impacts to Natural Resources.</i>			
Wetland Impacts	No wetland impacts. 5	No wetland impacts. 5	No wetland impacts. 5
Water Resources	No water resource impacts. 5	No water resource impacts. 5	No water resource impacts. 5
Floodplain Impacts	There is 1 floodplain impacted. 3	There is 1 floodplain impacted. 3	There is 1 floodplain impacted. 3

Evaluation Criteria	Anaheim (Edison Field/Metrolink)	Anaheim – Interstate 5	Garden Grove
Threatened & Endangered Species Impacts	Impact to San Fernando Valley Spineflower.	Impact to San Fernando Valley Spineflower.	Impact to San Fernando Valley Spineflower.
	4	4	4
<i>Minimize Impacts to Social and Economic Resources.</i>			
Environmental Justice Impacts (Demographics)	No known impacts to any minority population or low-income households.	Potential impacts to a minority population of approximately 3,200 people. No known impacts to any low-income households.	Potential impacts to a minority population of approximately 8,000 people. No known impacts to any low-income households.
	5	4	2
Community & Neighborhood Impacts	The City of Anaheim would be impacted.	The City of Anaheim would be impacted.	The City of Garden Grove would be impacted.
	4	3	2
Farmland Impacts	No farmland impacts.	No farmland impacts.	No farmland impacts.
	5	5	5
<i>Minimize Impacts to Cultural Resources.</i>			
Cultural Resources Impacts	No known cultural resources.	No known cultural resources.	No known cultural resources.
	5	5	5
Parks & Recreation/Wildlife Refuge Impacts	No parks and recreation/wildlife refuge resources.	No parks and recreation/wildlife refuge resources.	No parks and recreation/wildlife refuge resources.
	5	5	5
<i>Maximize Avoidance of Areas with Geologic and Soils Constraints.</i>			
Soils/Slope Constraints	There is 1 distinct soil type. Possible impacts from liquefaction.	There is 1 distinct soil type. Possible impacts from liquefaction.	There is 1 distinct soil type. Possible impacts from liquefaction.
	3	3	3

Evaluation Criteria	Anaheim (Edison Field/Metrolink)	Anaheim – Interstate 5	Garden Grove
Seismic Constraints	Potential impacts from 2 major seismic areas and faults.	Potential impacts from 2 major seismic areas and faults.	Potential impacts from 2 major seismic areas and faults.
	3	3	3
<i>Maximize Avoidance of Areas with Potential Hazardous Materials.</i>			
Hazardous Materials/Waste Constraints	There is 1 known hazardous material/waste site in the immediate vicinity.	No known hazardous material/waste sites.	There is 1 known hazardous material/waste site in the immediate vicinity.
	4	5	4

1 2 3 4 5
Highly Unfavorable Highly Favorable

Table 2-H-20 continued
Los Angeles to San Diego via Orange County - High-Speed Train Station Evaluation Matrix
Central Orange County (Anaheim) to Oceanside – Southern Orange County Stations

Station Name = Station Carried Forward

Station Name = Station Eliminated

Evaluation Criteria	Irvine Transportation Center	Irvine – I-5 at Jeffery Road	Newport Beach
<i>Maximize Ridership/Revenue Potential.</i>			
Travel Time			
Population & Employment Catchment <i>Data Based on 2020 Forecasts</i>	Population: 1,307,800 persons Employment: 906,503 persons 3	Population: 1,618,714 persons Employment: 1,149,916 persons 3	Population: 1,705,610 persons Employment: 1,200,373 persons 4
<i>Maximize Connectivity and Accessibility.</i>			
Intermodal Connections	<ul style="list-style-type: none"> • John Wayne – 7.5mi (12 km) • I-5 • Arterials • Amtrak • OCTA Buses • Metrolink 4	<ul style="list-style-type: none"> • John Wayne – 5.5mi. (8.8 km) • I-5 • I-405 • Arterials • OCTA Buses 3	<ul style="list-style-type: none"> • John Wayne – 1.5 mi (2.9 km) • SR-73 • Arterials • OCTA Buses 2
<i>Minimize Operating and Capital Costs.</i>			
Operational Issues	Shared-use with Amtrak and Metrolink. 3	New VHS/Maglev station 4	New VHS/Maglev station 4
Construction Issues	Existing station, but potential flight path restrictions (El Toro) on structures. 4	New aerial station; nearby freeway interchanges 3	Location on curve and in a trench; is a challenge; nearby freeway ramps and drainage channel in vicinity. 2

Evaluation Criteria	Irvine Transportation Center	Irvine – I-5 at Jeffery Road	Newport Beach
Capital Cost	Existing station off sets some costs 4	New station - aerial 3	New station; site complicated by roads and drainage channel at site. 2
Right-of-Way Issues/Cost	Existing site, plus new land 4	New land; proximity to "Old town Irvine" a potential issue. 3	Highly constrained by freeway & arterial roads. 2
<i>Maximize Compatibility with Existing and Planned Development.</i>			
Land Use Compatibility and Conflicts	Land use is mixed residential, commercial, light industrial, office space, with some areas of open space and farmland. 4	Land use is mixed residential, commercial, light industrial, office space, with some areas of open space and farmland. 3	Land use is mixed residential, commercial, office space, with some areas of open space and recreational uses. 2
Visual Quality Impacts	Visual impacts around proposed station include residential, mixed commercial, industrial, freeways. Areas of open space, natural vegetation, and farmland in the vicinity of the proposed station location. 4	Visual impacts around proposed station include residential, mixed commercial, industrial, freeways. Areas of open space, natural vegetation, and farmland in the vicinity of the proposed station location. 3	Visual impacts around proposed station include mixed residential, commercial, office space, and freeways. Areas of open space, natural vegetation, and Newport Back Bay are in the vicinity of the proposed station location. 2
<i>Minimize Impacts to Natural Resources.</i>			
Wetland Impacts	No wetland impacts. 5	No wetland impacts. 5	No wetland impacts. 5
Water Resources	No water resource impacts. 5	No water resource impacts. 5	No water resource impacts. 5
Floodplain Impacts	There is 1 100-year floodplain zone impact. 4	There is 1 100-year floodplain zone impact. 4	No floodplain impacts. 5

Evaluation Criteria	Irvine Transportation Center	Irvine – I-5 at Jeffery Road	Newport Beach
Threatened & Endangered Species Impacts	No impacts to any sensitive species. 5	No impacts to any sensitive species. 5	Impacts to 3 threatened or endangered species or species of special concern. 2
<i>Minimize Impacts to Social and Economic Resources.</i>			
Environmental Justice Impacts (Demographics)	No known impacts to any minority population or low-income households. 5	No known impacts to any minority population or low-income households. 5	No known impacts to any minority population or low-income households. 5
Community & Neighborhood Impacts	The City of Irvine would be impacted. 4	The City of Irvine would be impacted. 4	The City of Newport Beach and community of Santa Ana Heights would be impacted. 2
Farmland Impacts	No farmland impacts. 5	Impacts to several parcels of Prime Farmland. 4	No farmland impacts. 5
<i>Minimize Impacts to Cultural Resources.</i>			
Cultural Resources Impacts	No known cultural resources. 5	No known cultural resources. 5	No known cultural resources. 5
Parks & Recreation/Wildlife Refuge Impacts	No parks or recreation/wildlife refuge resources. 5	No parks or recreation/wildlife refuge resources. 5	No parks or recreation/wildlife refuge resources. 5
<i>Maximize Avoidance of Areas with Geologic and Soils Constraints.</i>			
Soils/Slope Constraints	There is 1 distinct soil type. Possible impacts from liquefaction. 3	There is 1 distinct soil type. Possible impacts from liquefaction. 3	There is 1 distinct soil type. Possible impacts from liquefaction. 3

Evaluation Criteria	Irvine Transportation Center	Irvine – I-5 at Jeffery Road	Newport Beach
Seismic Constraints	Potential impacts from 1 major seismic area and fault.	Potential impacts from 1 major seismic area and fault.	Potential impacts from one major seismic area and fault.
	3	3	3
<i>Maximize Avoidance of Areas with Potential Hazardous Materials.</i>			
Hazardous Materials/Waste Constraints	No known hazardous material/waste sites.	No known hazardous material/waste sites.	No known hazardous material/waste sites.
	5	5	5

1 2 3 4 5
Highly Unfavorable Highly Favorable

Table 2-H-20 continued
Los Angeles to San Diego via Orange County – High-Speed Train Station Evaluation Matrix
Central Orange County (Anaheim) to Oceanside – North San Diego County Stations

Station Name = Station Carried Forward

Station Name = Station Eliminated

Evaluation Criteria	Oceanside Transportation Center	Oceanside– I-5 at Oceanside Blvd.
<i>Maximize Ridership/Revenue Potential.</i>		
Travel Time		
Population & Employment Catchment <i>Data Based on 2020 Forecasts</i>	Population: 458,045 persons Employment: 259,653 persons	Population: 507,306 persons Employment: 273,692 persons
	2	2
<i>Maximize Connectivity and Accessibility.</i>		
Intermodal Connections	<ul style="list-style-type: none"> • Lindbergh – 34mi. (54.4 km) • I-5 • Arterials • NCTD Buses • Amtrak • Coaster • Metrolink • NCTD Oceanside/Escondido LRT 	<ul style="list-style-type: none"> • Lindbergh – 33mi. (52.8 km) • I-5 • Arterials • NCTD Buses • Potential LRT station - NCTD Oceanside/Escondido Line
	4	3
<i>Minimize Operating and Capital Costs.</i>		
Operational Issues	Shared-use with Amtrak, Coaster, and Metrolink	New VHS/Maglev station
	3	4
Construction Issues	New tracks; and one configuration has depressed alignment.	New station - aerial
	4	3

Evaluation Criteria	Oceanside Transportation Center	Oceanside– I-5 at Oceanside Blvd.
Capital Cost	Existing station off sets some costs.	New station - aerial
	4	3
Right-of-Way Issues/Cost	Constrained by tracks for future Oceanside-Escondido LRT.	I-5 bordered by private property
	3	3
<i>Maximize Compatibility with Existing and Planned Development.</i>		
Land Use Compatibility and Conflicts	Land use is mixed residential, commercial, office space, with some areas of open space and recreational uses.	Land use is mixed residential, commercial, office space, with some areas of open space and recreational uses.
	4	3
Visual Quality Impacts	View impacts around proposed station include residential, mixed commercial, and I-5 freeway. Some areas of open space, natural vegetation, beaches, and the Pacific Ocean dominate the views in the vicinity of the proposed station location.	View impacts around proposed station include residential, mixed commercial, and I-5 freeway. Some areas of open space, natural vegetation, beaches, and the Pacific Ocean dominate the views in the vicinity of the proposed station location.
	3	2
<i>Minimize Impacts to Natural Resources.</i>		
Wetland Impacts	Impact to 1 wetland.	Impacts to 1 wetland.
	3	3
Water Resources	No water resource impacts.	No water resource impacts.
	5	5
Floodplain Impacts	There is 1 100-year floodplain zone impacted.	There is 1 100-year floodplain zone impacted.
	3	3

Evaluation Criteria	Oceanside Transportation Center	Oceanside– I-5 at Oceanside Blvd.
Threatened & Endangered Species Impacts	Impact to 1 threatened or endangered species or species of special concern. 4	Impact to 1 threatened or endangered species or species of special concern. 4
<i>Minimize Impacts to Social and Economic Resources.</i>		
Environmental Justice Impacts (Demographics)	Potential impacts to a minority population of approximately 300 people. No known impacts to any low-income households. 4	Potential impacts to a minority population of approximately 650 people. No known impacts to any low-income households. 3
Community & Neighborhood Impacts	The City of Oceanside would be impacted. 3	The City of Oceanside would be impacted. 3
Farmland Impacts	No farmland impacts. 5	No farmland impacts. 5
<i>Minimize Impacts to Cultural Resources.</i>		
Cultural Resources Impacts	There is 1 known cultural resource in the immediate vicinity. 3	There is 1 known cultural resource in the immediate vicinity. 3
Parks & Recreation/Wildlife Refuge Impacts	No parks or recreation/wildlife refuge resources. 5	No parks or recreation/wildlife refuge resources. 5

Evaluation Criteria	Oceanside Transportation Center	Oceanside– I-5 at Oceanside Blvd.
<i>Maximize Avoidance of Areas with Geologic and Soils Constraints.</i>		
Soils/Slope Constraints	There is 1 distinct soil type. Possible impacts from liquefaction occur in the immediate vicinity.	There is 1 distinct soil type. Possible impacts from liquefaction occur in the immediate vicinity.
	3	3
Seismic Constraints	Potential impacts from 1 major seismic area and fault.	Potential impacts from 1 major seismic area and fault.
	3	3
<i>Maximize Avoidance of Areas with Potential Hazardous Materials.</i>		
Hazardous Materials/Waste Constraints	There is 1 known hazardous material/waste site in the immediate vicinity.	No known hazardous material/waste sites.
	4	5

1 2 3 4 5
Highly Unfavorable Highly Favorable

Table 2-H-20 continued
Los Angeles to San Diego via Orange County – High-Speed Train Station Evaluation Matrix
Oceanside to San Diego – Central San Diego County Stations

Station Name = Station Carried Forward

Station Name = Station Eliminated

Evaluation Criteria	Solana Beach - Amtrak	Solana Beach – I-5 at Lomas Santa Fe Dr.	University Towne Centre
<i>Maximize Ridership/Revenue Potential.</i>			
Travel Time			
Population & Employment Catchment <i>Data Based on 2020 Forecasts</i>	Population: 496,489 persons Employment: 305,176 persons	Population: 560,328 persons Employment: 348,080 persons	Population: 888,420 persons Employment: 549,639 persons
	2	2	2
<i>Maximize Connectivity and Accessibility.</i>			
Intermodal Connections	<ul style="list-style-type: none"> SD Airport – 17mi. (27.2 km) I-5 Arterials NCTD Buses Coaster Amtrak 	<ul style="list-style-type: none"> SD Airport – 17mi. (27.2 km) I-5 NCTD Buses 	<ul style="list-style-type: none"> SD Airport – 9.5mi. (15.2 km) I-5 Arterials NCTD Buses MTDB Buses Potential LRT station - San Diego Trolley
	3	2	4
<i>Minimize Operating and Capital Costs.</i>			
Operational Issues	Shared-use	New VHS/Maglev station	New VHS/Maglev station - Shared-use
	3	4	3
Construction Issues	Station platforms already in a trench; difficult to widen for more tracks.	Narrow I-5 median; little ROW	Station in deep tunnel under UTC.
	2	3	1

Evaluation Criteria	Solana Beach - Amtrak	Solana Beach – I-5 at Lomas Santa Fe Dr.	University Towne Centre
Capital Cost	Partially off set by existing station	New station - aerial	Highest capital cost of the 3 options because station is in a tunnel.
	3	2	1
Right-of-Way Issues/Cost	Partially off set by existing station	Narrow I-5 median; little ROW	Tunnel below public streets.
	3	2	3
<i>Maximize Compatibility with Existing and Planned Development.</i>			
Land Use Compatibility and Conflicts	Land use is mixed residential and commercial with some areas of open space and recreational uses.	Land use is mixed residential and commercial with some areas of open space and recreational uses.	Land use is mixed residential, light industrial and commercial, and areas of open space.
	4	2	3
Visual Quality Impacts	View impacts around proposed station include residential, light commercial, and I-5 freeway. Some areas of open space, natural vegetation, beaches, and the Pacific Ocean dominate the views in the vicinity of the proposed station location.	View impacts around proposed station include residential, light commercial, and I-5 freeway. Some areas of open space, natural vegetation, beaches, and the Pacific Ocean dominate the views in the vicinity of the proposed station location.	View impacts around proposed station include mixed residential, and I-5 freeway. Areas of open space, natural vegetation, rolling hills, beaches, and the Pacific Ocean dominate the views in the vicinity of the proposed station location. The station is in close proximity to the UCSD campus.
	4	2	3
<i>Minimize Impacts to Natural Resources.</i>			
Wetland Impacts	No wetland impacts.	Impact to 1 wetland.	No wetland impacts.
	5	3	5
Water Resources	No water resource impacts.	No water resource impacts.	No water resource impacts.
	5	5	5
Floodplain Impacts	No floodplain impacts.	There is 1 100-year floodplain zone impact.	No floodplain impacts.
	5	3	5

Evaluation Criteria	Solana Beach - Amtrak	Solana Beach – I-5 at Lomas Santa Fe Dr.	University Towne Centre
Threatened & Endangered Species Impacts	No impacts to any sensitive species.	No impacts to any sensitive species.	Impacts to two threatened or endangered species or species of special concern.
	5	5	3
<i>Minimize Impacts to Social and Economic Resources.</i>			
Environmental Justice Impacts (Demographics)	No known impacts to any minority population or low-income households.	No known impacts to any minority population or low-income households.	No known impacts to any minority population or low-income households.
	5	5	5
Community & Neighborhood Impacts	Solana Beach and Eden Gardens would be impacted.	Solana Beach and Eden Gardens would be impacted.	The City of San Diego and the community of University City would be impacted.
	3	3	3
Farmland Impacts	No farmland impacts.	No farmland impacts.	No farmland impacts.
	5	5	5
<i>Minimize Impacts to Cultural Resources.</i>			
Cultural Resources Impacts	There is 1 cultural resource in the immediate vicinity.	There is 1 cultural resource in the immediate vicinity.	There is 1 cultural resource in the immediate vicinity.
	3	3	3
Parks & Recreation/Wildlife Refuge Impacts	No parks or recreation/wildlife refuge resources.	No parks or recreation/wildlife refuge resources.	No parks or recreation/wildlife refuge resources.
	5	5	5

Evaluation Criteria	Solana Beach - Amtrak	Solana Beach – I-5 at Lomas Santa Fe Dr.	University Towne Centre
<i>Maximize Avoidance of Areas with Geologic and Soils Constraints.</i>			
Soils/Slope Constraints	There is 1 distinct soil type. Possible impacts from liquefaction occur in the immediate vicinity.	There is 1 distinct soil type. Possible impacts from liquefaction occur in the immediate vicinity.	There is 1 distinct soil type. Possible impacts from liquefaction occur in the immediate vicinity.
	3	3	3
Seismic Constraints	Potential impacts from 1 major seismic area and fault.	Potential impacts from 1 major seismic area and fault.	Potential impacts from 1 major seismic area and fault.
	3	3	2
<i>Maximize Avoidance of Areas with Potential Hazardous Materials.</i>			
Hazardous Materials/Waste Constraints	No known hazardous material/waste sites.	No known hazardous material/waste sites.	No known hazardous material/waste sites.
	5	5	5

1 2 3 4 5
Highly Unfavorable Highly Favorable

Table 2-H-20 continued
Los Angeles to San Diego via Orange County – High-Speed Train Station Evaluation Matrix
Oceanside to San Diego – Downtown / Airport Stations

Station Name = Station Carried Forward

Station Name = Station Eliminated

Evaluation Criteria	Santa Fe Depot	San Diego Airport
<i>Maximize Ridership/Revenue Potential.</i>		
Travel Time	Refer to Options D1a and D1b	Refer to Option D2
Population & Employment Catchment <i>Data Based on 2020 Forecasts</i>	Population: 1,262,755 persons Employment: 661,334 persons	Population: 1,311,448 persons Employment: 698,369 persons
	4	4
<i>Maximize Connectivity and Accessibility.</i>		
Intermodal Connections	<ul style="list-style-type: none"> SD Airport – 1.5mi. (2.4 km) I-5 Arterials MTDB Buses San Diego Trolley Amtrak Coaster <i>For details refer to Intermodal Connections in Section 4.1.4</i>	<ul style="list-style-type: none"> SD Airport – 1 mi. (1.6 km) I-5 Arterials MTDB Buses San Diego Trolley <i>For details refer to Intermodal Connections in Section 4.1.4</i>
	4	3
<i>Minimize Operating and Capital Costs.</i>		
Operational Issues	Shared-use with Amtrak and Coaster	New VHS/Maglev; optional LOSSAN site.
	3	4
Construction Issues	Existing historic station; existing hub for local transit including light-rail. Under Option D1b, VHS train platforms would be below grade.	Aerial station, challenge is proximity to I-5 and the San Diego Trolley station.
	2	3

Evaluation Criteria	Santa Fe Depot	San Diego Airport
Capital Cost	Partial off set by existing station. 4	New station 3
Right-of-Way Issues/Cost	Partial off set by existing station. 4	New station in highly constrained area. 2
<i>Maximize Compatibility with Existing and Planned Development.</i>		
Land Use Compatibility and Conflicts	Land use is common to heavy urbanized downtown areas with a mixture of residential, commercial, industrial, heavy office space, and transportation centers. 4	Land use is common to heavy urbanized downtown areas with a mixture of residential, commercial, industrial, heavy office space, and transportation centers. 4
Visual Quality Impacts	Visual impacts around proposed station are heavy urbanization including mixed residential, commercial, industrial, and utility lines. No areas of open space or natural vegetation. San Diego Bay and the Pacific Ocean dominate the view to the west. 3	Visual impacts around proposed station are heavy urbanization including mixed residential, commercial, industrial, and utility lines. No areas of open space or natural vegetation. San Diego Bay and the Pacific Ocean dominate the view to the west. 3
<i>Minimize Impacts to Natural Resources.</i>		
Wetland Impacts	No wetland impacts. 5	No wetland impacts. 5
Water Resources	No water resource impacts. 5	No water resource impacts. 5
Floodplain Impacts	No floodplain impacts. 5	No floodplain impacts. 5

Evaluation Criteria	Santa Fe Depot	San Diego Airport
Threatened & Endangered Species Impacts	No impacts to any sensitive species. 5	No impacts to any sensitive species. 5
<i>Minimize Impacts to Social and Economic Resources.</i>		
Environmental Justice Impacts (Demographics)	No known impacts to any minority population or low-income households. 5	Potential impacts to minority population of approximately 500 people. No known impacts to any low-income households. 4
Community & Neighborhood Impacts	The City of San Diego, Old Town, and Loma Portal would be impacted. 4	The City of San Diego and Middle Town would be impacted. 4
Farmland Impacts	No farmland impacts. 5	No farmland impacts. 5
<i>Minimize Impacts to Cultural Resources.</i>		
Cultural Resources Impacts	There are several cultural resources that occur in the immediate vicinity. 3	There is one cultural resource that occurs in the immediate vicinity. 4
Parks & Recreation/Wildlife Refuge Impacts	No parks or recreation/wildlife refuge resources. 5	No parks or recreation/wildlife refuge resources. 5
<i>Maximize Avoidance of Areas with Geologic and Soils Constraints.</i>		
Soils/Slope Constraints	One distinct soil type occurs within the area of the proposed station. Possible impacts from liquefaction occur in the immediate vicinity of the proposed station. 3	One distinct soil type occurs within the area of the proposed station. Possible impacts from liquefaction occur in the immediate vicinity of the proposed station. 3

Evaluation Criteria	Santa Fe Depot	San Diego Airport
Seismic Constraints	Potential impacts from 1 major seismic area and fault.	Potential impacts from 1 major seismic area and fault.
	3	3
<i>Maximize Avoidance of Areas with Potential Hazardous Materials.</i>		
Hazardous Materials/Waste Constraints	No known hazardous material/waste sites.	There are 2 known hazardous material/waste sites in the immediate vicinity.
	5	4

1 2 3 4 5
Highly Unfavorable Highly Favorable